

ON STATE OF THE ART RESEARCH TRENDS IN ALBANIA REGARDING DIGITALIZATION. AUTOMATION AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

Sustainable development is nowadays a key concern and major issue in scientific, political and decision making discussions in national and international organizations, enterprises and societies at all levels. Moreover, it has been emerged as a major multidisciplinary research field for all sciences including formal sciences, natural sciences, engineering and technology, applied sciences as well as economics and social sciences. On the other hand, the role of digitalization and automation as engines of the transformation of business, economies and societies to meet the currently defined sustainability goals is critical. Therefore, there is increased coupling between digitalization, automation and sustainability in terms of multidisciplinary research studies worldwide. In the herein research effort the goal is to analyze this emerging coupling by investigating state of the art research efforts in these multidisciplinary fields with regards to the Albania case. The investigation of such state of the art trends spans the years after 2015, since very few studies were conducted before, especially in Albania. But worldwide too, if it is considered that the term sustainable development was defined unofficially in 1972 and officially in 1987 and only during the last decade systematic research studies started appearing.

Keywords: *Sustainable development, digitalization, digital transformation, automation, research in Albania*

MAIN RESEARCH ISSUES IN DIGITALIZATION AND DIGITAL TRANSFORMATIONS

The term Digitalization refers to the process of converting information, data, processes, and activities into digital formats. It involves the adoption and integration of digital technologies in various aspects of life, including business, education, communication, science, finance, healthcare, governance and entertainment. Digitalization involves the use of computers, the internet, the cloud most prominently nowadays, software applications, and other digital tools to transform analog or manual processes into digital ones. In the context of business, digitalization often involves implementing digital tools and technologies to enhance operational processes, improve customer experiences, and enable data-driven decision-making. This may include the digitization of paper-based documents, the automation of manual tasks, the utilization of cloud computing and data analytics, the adoption of e-commerce platforms, and the development of digital marketing strategies. It enables new business models, enhances productivity and efficiency, fosters innovation and collaboration, and provides opportunities for new products and services.

On the other hand, the term Digital transformations refers to the comprehensive and strategic process through which organizations leverage digital technologies to fundamentally change their business models, operations, and customer experiences. It involves usage of digital technologies and integrating them into all aspects of an organization to drive significant improvements in efficiency, agility, innovation, and customer value. Digital transformation

is not simply about implementing isolated digital tools or automating existing processes or transforming data to digital formats. It requires a holistic approach that rethinks and reinvents the way organizations, governments, enterprises operate, interacting with customers and deliver value. It involves a shift in mindset, culture, and processes to embrace digital capabilities and leverage data-driven insights for improved decision-making, management and governance. The field of Digitalization and Digital Transformations (Reis, J., Amorim, et al., (2018). Teichert, R. (2019) and Ziyadin, S., et al. (2020)), encompasses research mainly in the following topics:

Data Analytics and Business Intelligence:

Focusing on leveraging data to gain insights and drive data-driven decision-making through collecting, analyzing, and interpreting data to understand customer behavior, optimize operations, and identify growth opportunities among many others.

Cybersecurity and Data Privacy:

Including research for ensuring the security and privacy of digital assets, data, and systems critical in the digital age. Focusing on implementing robust cybersecurity measures, developing data protection policies, and managing risks associated with digital technologies.

Digital Strategies development:

Focusing on aligning digital initiatives with business objectives, identifying opportunities for innovation, and defining the overall digital direction of organizations and businesses.

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Digital Innovation and Research:

Exploring emerging technologies, conducting research, and identifying innovative digital solutions that can drive competitive advantage and business growth. Including areas such as artificial intelligence (AI), Internet of Things (IoT), blockchain, cloud computing, and data analytics.

Digital Customer Experience management:

Enhancing the customer experience through digital channels, focusing on understanding customer behaviours, preferences, and needs in the digital space and designing seamless and personalized digital experiences, including user interface (UI) and user experience (UX) design.

Digital Marketing and Communication:

Encompassing strategies and techniques for promoting products, services, and the organizational and businesses brands through digital channels. Including social media marketing, search engine optimization (SEO), content marketing, digital advertising, and influencer marketing as well as personalized marketing research.

Digital Project Management:

Investigating effective project management to ensure successful implementation and delivery. Focusing on managing digital initiatives, coordinating cross-functional teams, defining project timelines and budgets, and ensuring the alignment of projects with organizational, enterprises and business goals.

Digital Talent and Skills Development:

Building digital capabilities within the organization, enterprise or business essential for successful digital

transformation. Focusing on identifying digital skills gaps, implementing training and development programs, and attracting and retaining digital talent to support the organization's digital initiatives.

Process Automation and Optimization:

Conducting Research aiming at leveraging digital technologies to streamline and improve organizational and business processes. Focusing on identifying opportunities for automation, implementing robotic process automation (RPA), and optimizing workflows to increase efficiency and reduce costs.

Digital Change Management and Digital Adoption:

Focusing on Digital transformation requirements in managing change effectively and ensuring the adoption of digital technologies throughout the organizations and businesses. Conducting research on creating change management strategies, fostering a digital culture, and providing training and support to facilitate the adoption of digital tools and processes.

The herein research has been organized by adopting SCOPUS peer reviewed research database querying. The complex queries involved included the terms "Digitalization", "Digital Transformations", "Data Analytics" and "Business Intelligence", with publication year after 2015 and country of affiliation Albania. The conducted advanced search is limited only to English language journal articles, considering that the research efforts with such characteristics would have the best probabilities for resulting in higher impact in the state-of-the-art research and development worldwide.

Based on such a setup the results obtained with regards to the relevant state of the art research in Albania are shown in figures 1, 2, 3 and table 1 below.

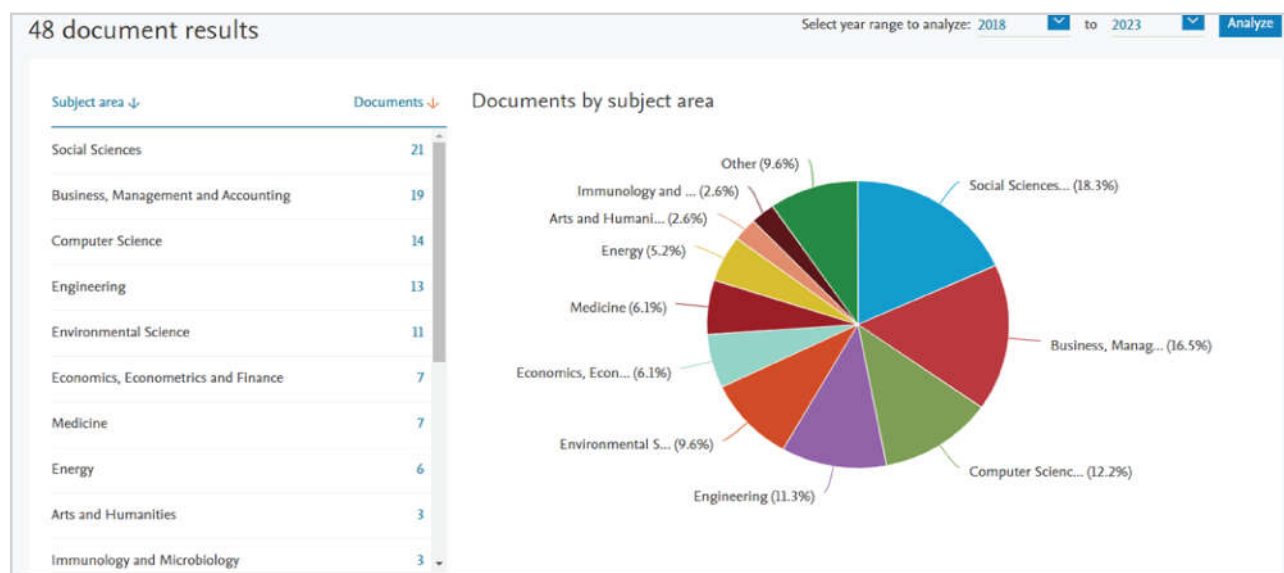


Figure 1- Subject areas in the field of Digitalization and Digital transformations in research in Albania since 2016.

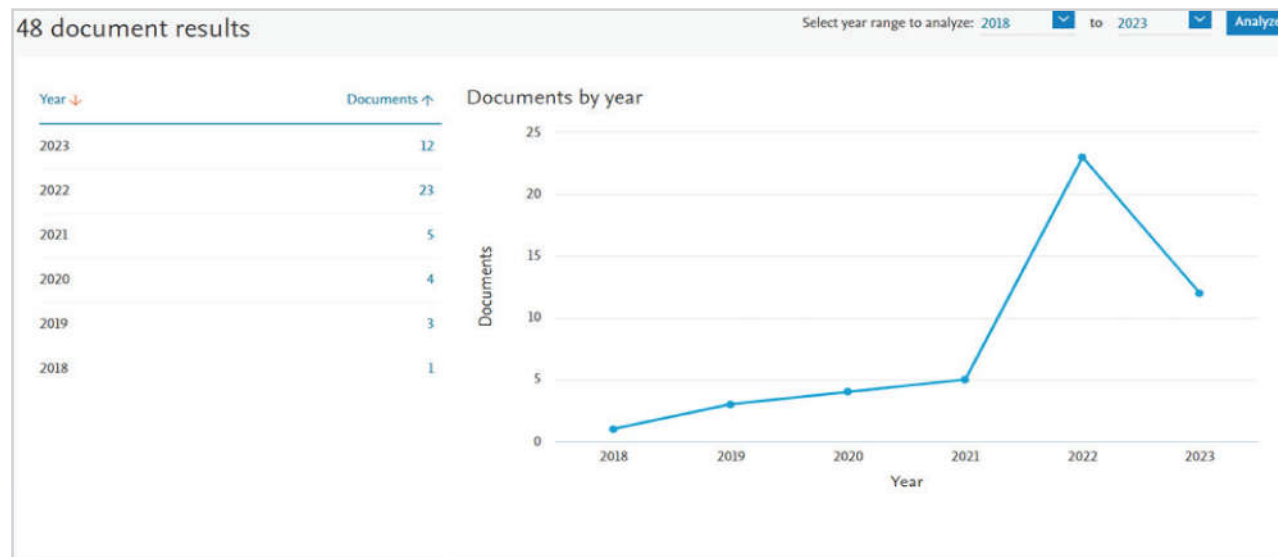


Figure 2- Evolution of research in the field of Digitalization and Digital transformations in Albania since 2016.

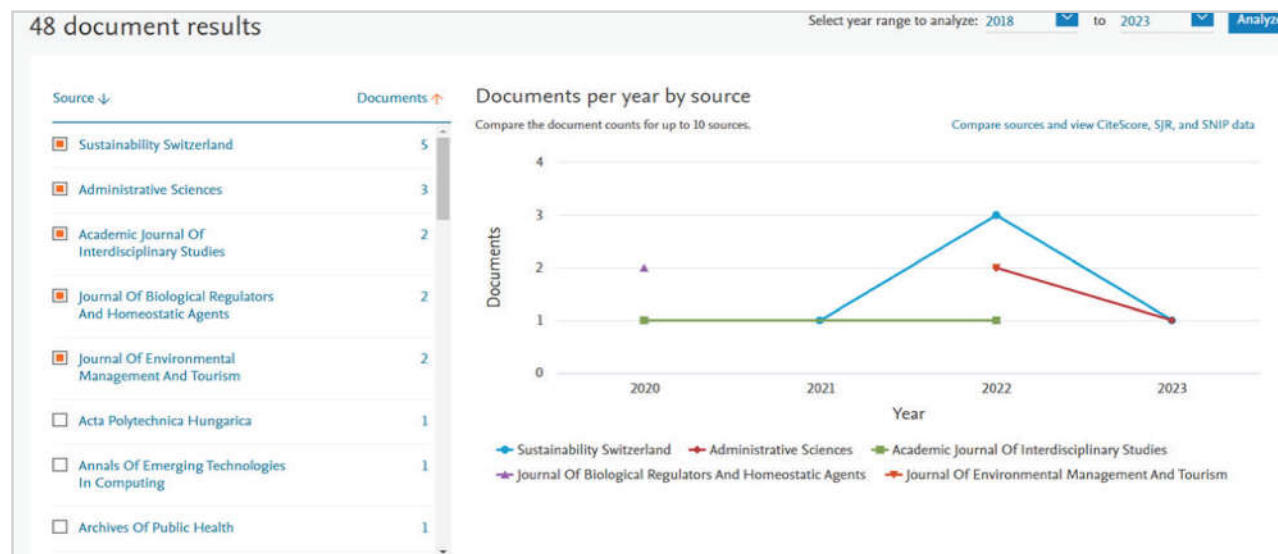


Figure 3- Main sources (journals) in the field of Digitalization and Digital transformations where the research in Albania since 2016 has been published.

Table 1 – Research topics in the field of Digitalization and Digital transformations in Albania in the first half of 2023.

Authors	Title	Year	Source title	Affiliations
Fernández A.; Gómez B.; Binjaku K.; Meçe E.K. et al.	Digital transformation initiatives in higher education institutions: A multivocal literature review	2023	Education and Information Technologies	Department of Computer Engineering, Faculty of Information Technology, Polytechnic University of Tirana, Tirane, Albania
Rexhaj F.; Vilks A.; Sirenko N.; Dubinina M.; Melnyk O.; Bodnar O.	Participation of international organisations in solving the problems of the agricultural sector of Ukraine	2023	International Journal of Environmental Studies	Department of Plant Protection, Agricultural University in Tirana, Tirana, Albania

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Cobianchi L.; Piccolo D.; Dal Mas F.; et al.;	Surgeons' perspectives on artificial intelligence to support clinical decision-making in trauma and emergency contexts: results from an international survey	2023	World Journal of Emergency Surgery	University Department of Surgery, University of Medicine, Tirana, Albania;
Çipi A.; Fernandes A.C.R.D.; Ferreira F.A.F.; Ferreira N.C.M.Q.F.; Meidutė- et al.	Detecting and developing new business opportunities in society 5.0 contexts: A socio-technical approach	2023	Technology in Society	University of Vlora "Ismail Qemali", Sheshi Pavarësia, Vlorë, 9401, Albania
Fait M.; Magni D.; Perano M.; Farina Briamonte M.; Sasso P.	Grassroot processes of knowledge sharing to build social innovation capabilities	2023	Journal of Knowledge Management	Scientific Research Center, Reald University College, Vlorë, Albania
Gjika I.; Pano N.	Human resource development AS a contributor to industry 4.0 implementation IN Albania	2023	Electronic Journal of Information Systems in Developing Countries	Mediterranean University of Albania, Tirana, Albania
Jiang X.; Akbar A.; Hysa E.; Akbar M.	Environmental protection investment and enterprise innovation: evidence from Chinese listed companies	2023	Kybernetes	Department of Economics, Epoka University, Tirana, Albania;
Vis C.; Schuurmans J.; Aouizerate B.; Craggs M.A.; Batterham P.; et al.	Effectiveness of Self-guided Tailored Implementation Strategies in Integrating and Embedding Internet-Based Cognitive Behavioral Therapy in Routine Mental Health Care: Results of a Multi-center Stepped-Wedge Cluster Randomized Trial	2023	Journal of Medical Internet Research	Institute of Public Health, Tirana, Albania; Department of Public Health, Faculty of Medicine, University of Medicine, Tirana, Albania;
Daskalakis G.; Pergialiotis V.; Domellöf M.; Ehrhardt H.; Di Renzo G.C.; Koç E.; et al.	European guidelines on perinatal care: corticosteroids for women at risk of preterm birth	2023	Journal of Maternal-Fetal and Neonatal Medicine	Department of Obstetrics and Gynaecology, Maternity Koco Gliozheni Hospital, Tirana, Albania;
Perano M.; Cammarano A.; Varriale V.; Del Regno C.; Michelino F.; Caputo M.	Embracing supply chain digitalization and unphysicalization to enhance supply chain performance: a conceptual framework	2023	International Journal of Physical Distribution and Logistics Management	Department of Management, Reald University College, Vlorë, Albania
Ndou V.; Hysa E.; Maruccia Y.	A Methodological Framework for Developing a Smart-Tourism Destination in the Southeastern Adriatic-Ionian Area	2023	Sustainability (Switzerland)	Department of Economics, Epoka University, Tirana, 1032, Albania

Lulaj E.; Dragusha B.; Hysa E.	Investigating Accounting Factors through Audited Financial Statements in Businesses toward a Circular Economy: Why a Sustainable Profit through Qualified Staff and Investment in Technology?	2023	Administrative Sciences	Faculty of Management in Tourism, Hospitality and Environment, "Haxhi Zeka" University, Eliot Engel, Peja, Kosovo, Faculty of Economy, University of Shkodra, Jeronim De Rada, Sheshi "Dugajt e Reja", Shkoder, Albania; Dept. of Economics, Epoka University, Tirana, 1032, Albania
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AUTOMATION AND SMART CITIES DEVELOPMENT

The fields of automation and smart cities development are two distinct but interconnected areas within the realm of digital transformation and technological advancement. More specifically, the automation field involves the use of technology to automate and optimize various tasks and processes traditionally performed by humans. It encompasses the application of technologies like robotics, mechatronics, artificial intelligence (AI), machine learning (ML), and advanced algorithms to streamline operations, enhance productivity, and reduce human intervention. On the other hand, the Smart Cities Development field refers to the integration of technology and data-driven solutions to enhance the quality of life, sustainability, and efficiency of urban areas, together with imposing a dramatic improvement in quality of service considering all human activities and processes as well as with offering new important services to the citizens. This integrated field encompass research (Ivančić, L., et al. (2019). Dey, C et al. (2020), Tomor, Z.,et al. (2019), Arroub, et al. (2016)) mainly in the following topics:

Industrial Automation:

Involving the application of technologies such as robotics, programmable logic controllers (PLCs), and advanced control systems to optimize manufacturing processes and improve productivity. Encompassing areas like factory automation, process automation, and assembly line automation.

Robotic Systems:

Focusing on designing, developing, and deploying robots for various applications, including industrial manufacturing, logistics and warehousing, healthcare, agriculture, and service industries. Encompassing areas such as robot programming, motion control, and human-robot collaboration.

Control Systems:

Focusing on designing and implementing control systems, such as feedback control, supervisory control, and distributed control systems, to automate and optimize processes across industries.

Process Automation:

Focusing on research aiming to streamline and optimize complex processes in industries like chemical,

oil and gas, pharmaceuticals, and food and beverage. Encompassing implementation of automation solutions, such as distributed control systems (DCS), programmable automation controllers (PAC), and process optimization algorithms, to enhance operational efficiency, quality, and safety.

Intelligent Systems:

Conducting research encompassing technologies like artificial intelligence (AI), machine learning (ML), and data analytics to enable automation systems to learn, adapt, and make intelligent decisions. Focusing on developing algorithms, predictive models, and intelligent control systems that can improve automation performance and enable autonomous decision-making.

Mechatronics:

Conducting research combining mechanical engineering, electronics, control systems, and computer science to develop integrated systems with sensing, actuation, and control capabilities. Aiming at designing and implementing mechatronic systems that integrate mechanical components, electronics, and software to achieve industrial automation objectives.

Instrumentation and Sensors:

Designing automation systems, enabling the collection of real-time data and feedback for control and monitoring. Focusing on selecting, integrating, and calibrating sensors and instrumentation devices for automation applications, including temperature, pressure, flow, and level sensors.

Automation in Energy and Utilities:

Designing automation systems for energy generation, distribution, and management. Designing and implementing automation solutions for power plants, renewable energy systems, smart grids, water treatment plants, and waste management facilities to enhance efficiency, optimize resource usage, and improve sustainability.

Home and Building Automation:

Focusing on integrating automation technologies within residential and commercial buildings. Encompassing technologies such as smart lighting,

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HVAC automation, security systems, energy management systems, and home automation platforms to enhance comfort, convenience, energy efficiency, and safety.

Process Optimization and Data Analytics:

Conduct research on leveraging data collected from automation systems to identify inefficiencies, bottlenecks, and opportunities for improvement. Focusing on using data analytics techniques, statistical analysis, and optimization algorithms to enhance automation performance, reduce costs, and optimize resource allocation.

Smart City Planning and Strategy:

Developing comprehensive methods, plans and strategies for transforming cities into smart cities. Encompassing identifying key areas for improvement, setting goals and objectives, and establishing roadmaps for implementing automation technologies and intelligent systems across various urban sectors.

Internet of Things (IoT) and Sensor Networks:

Focusing on research on deploying and managing networks of interconnected devices and sensors to collect real-time data on various urban parameters such as air quality, traffic flow, waste management, energy consumption, and infrastructure performance.

Urban Mobility and Transportation:

Conducting research on enhancing transportation systems and improving mobility within cities as key aspects of smart city initiatives. Designing and implementing intelligent transportation systems, designing and developing smart traffic management solutions, promoting sustainable transportation options, and integrating public transportation systems with digital platforms.

Energy Management and Efficiency:

Conducting research on emphasizing energy management and efficiency to reduce environmental impact and optimize resource usage. Focusing on

implementing smart grids, energy monitoring systems, energy-efficient infrastructure, and renewable energy solutions to achieve sustainable and cost-effective energy consumption.

Waste Management and Recycling:

Conducting research on employing automation technologies to improve waste management processes and promote recycling. Designing and implementing smart waste collection systems, optimizing waste sorting and disposal, and utilizing data-driven approaches to minimize waste generation and enhance recycling efforts.

Smart Buildings and Infrastructure:

Focusing on integrating automation and intelligent systems into buildings and infrastructure to improve energy efficiency, safety, and comfort. Including technologies such as smart lighting, building automation systems, intelligent HVAC (heating, ventilation, and air conditioning), as well as infrastructure monitoring systems.

Data Analytics and Urban Planning:

Utilizing data analytics and urban planning methodologies for informed decision-making in smart cities. Involving analyzing large volumes of data collected from various sources to gain insights into urban trends, optimize resource allocation, and support evidence-based urban planning and policy-making.

The herein research has been organized again by adopting SCOPUS peer reviewed research database querying. The complex queries involved included the terms “Robotics”, “Mechatronics”, “Smart cities” and “Sensors”, with publication year after 2015 and country of affiliation Albania., considering that the research efforts with such characteristics would have the best probabilities for resulting in higher impact in the state-of-the-art research and development worldwide. Based on such a setup the results obtained with regards to the relevant state of the art research in Albania are shown in figures 4, 5, 6 and table 2 below.

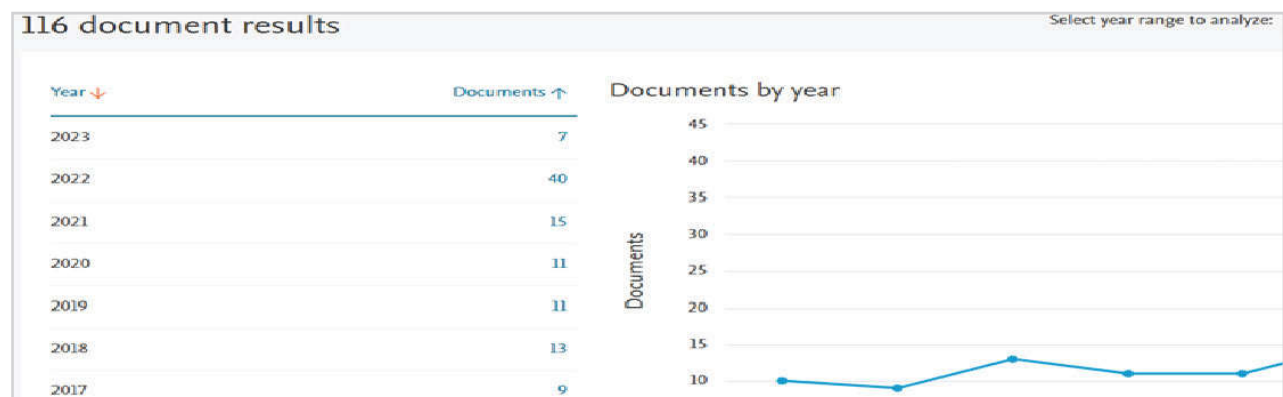


Figure 4- Subject areas in the fields of Automation and Smart Cities Development in research in Albania since 2016.

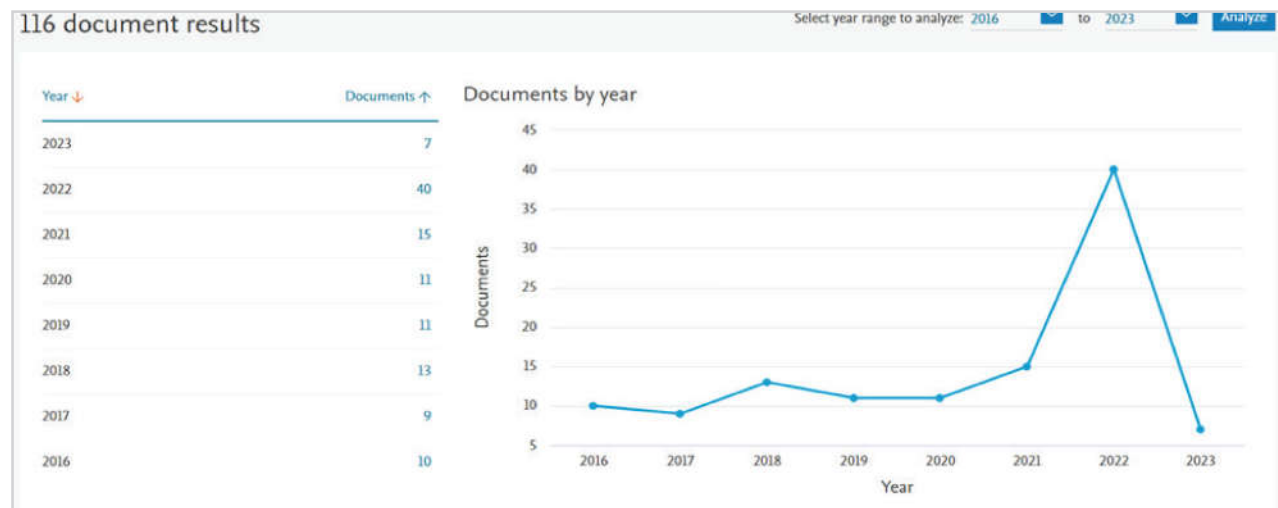


Figure 5- Evolution of research in the field of Automation and Smart Cities in Albania since 2016.

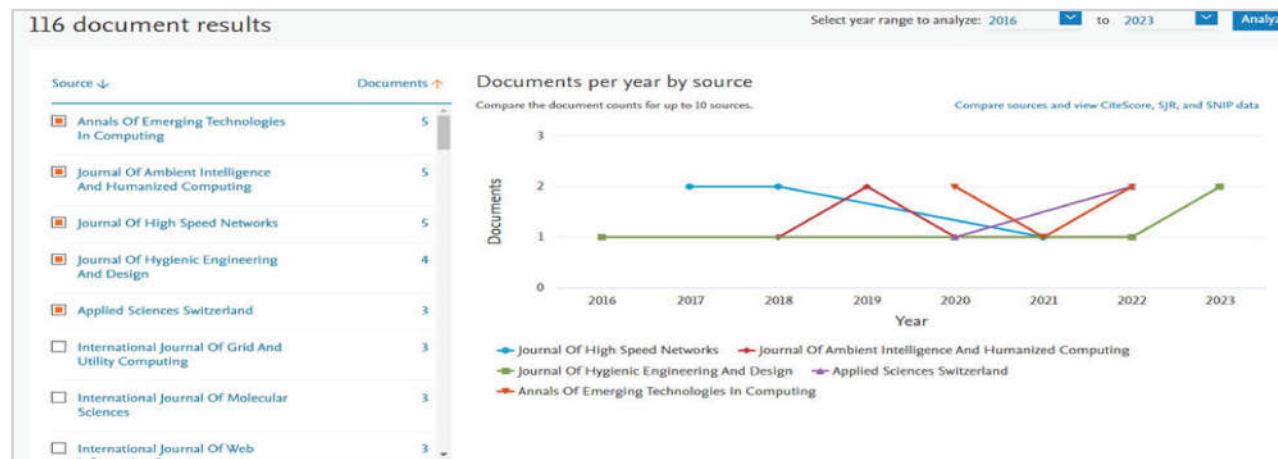


Figure 6- Main sources (journals) in the field of Automation and Smart Cities where the research in Albania since 2016 has been published.

Table 2 – Research topics in the field of Automation and Smart Cities Development in Albania in the first half of 2023.

Authors	Title	Year	Source title	Affiliations
Uka A.; Sitz G.O.	Electronic spectroscopy studies of Cu(100) following atomic hydrogen exposure	2023	Journal of Electron Spectroscopy and Related Phenomena	Faculty of Architecture and Engineering, Epoka University, Tirana, 1032, Albania; Department of Physics, University of Texas at Austin, Austin, 78712, TX, United States
Ndou V.; Hysa E.; Maruccia Y.	A Methodological Framework for Developing a Smart-Tourism Destination in the Southeastern Adriatic-Ionian Area	2023	Sustainability (Switzerland)	Department of Engineering for Innovation, University of Salento, Lecce, 73100, Italy; Department of Economics, Epoka University, Tirana, 1032, Albania

Broli N.; Vasjari M.; Cenolli S.; Vallja L.; Duka S.; Shehu A.	ELECTROCHEMICAL DETERMINATION OF ANTI-BIOTICS AT NANO-MODIFIED CARBON PASTE ELECTRODE	2023	Journal of Hygienic Engineering and Design	Department of Chemistry, Faculty of Natural Science, University of Tirana, Bulevardi Zogu I, Tirana, 1001, Albania; Nano-Alb, Academy of Sciences of Albania, Fan Noli 7, Tirana, 1001, Albania
Lico L.; Enesi I.; Meka S.J.R.	An End-to-End Deep Learning System for Recommending Healthy Recipes Based on Food Images	2023	International Journal of Advanced Computer Science and Applications	Electronic and Telecommunication Department, Polytechnic University of Tirana, Albania
Vasjari M.; Broli N.; Cenolli S.; Aliko V.; Vasjari L.; Hajdaraj G.; Faggio C.	DEVELOPMENT OF FERRITIN ELECTROCHEMICAL IMUNOSENSOR BASED ON CPE MODIFICATION	2023	Journal of Hygienic Engineering and Design	Department of Chemistry, Faculty of Natural Science, University of Tirana, Boulevard Zogu I nn, Tirana, 1001, Albania; Department of Biology, Faculty of Natural Sciences, University of Tirana, Boulevard Zogu I nn, Tirana, 1001, Albania; Nano-Alb, Academy of Sciences of Albania, Fan Noli 7, Tirana, 1001, Albania; Clinic-Biochemical Laboratory-Ajel Diagnostic, Teodor Keko nn, Tirana, 1001, Albania;
Dervishi S.; Baçi N.	Early design evaluation of low-rise school building morphology on energy performance: Climatic contexts of Southeast Europe	2023	Energy	Department of Architecture, Epoka University, Rruga Tiranë-Rinas, Km 12, Tirana, 1039, Albania
Enesi I.; Kuqi A.	Performance Analysis for 3D Reconstruction Objects in Meshroom and Agisoft—A Comparative Study	2023	International journal of online and biomedical engineering	Department of Electronic and Telecommunication, Polytechnic University of Tirana, Tirana, Albania

SUSTAINABILITY, CIRCULAR ECONOMY AND MATERIALS SCIENCE FOR SUSTAINABILITY

Sustainability, Circular Economy, and Materials Science for Sustainability are three interconnected and very closed fields that focus on addressing environmental and earth resource limitations challenges, promoting sustainable practices in all sectors of finance and society. More specifically,

Sustainability involves the responsible and optimized use of resources and the development of processes and practices that meet present needs without compromising the ability of future generations to meet their own needs. It encompasses environmental, social, cultural and economic dimensions, commonly referred to as the pillars of sustainability.

In the context of sustainability, efforts are directed towards reducing carbon emissions, conserving natural resources, promoting renewable energy sources, managing waste effectively, and addressing social and equity issues, together with peace and conflict resolution. Sustainability aims to create a balance between human activities and the Earth's ecosystems to ensure a sustainable and liveable planet.

On the other hand, circular economy is an economic model that aims to maximize the value of resources and minimize waste generation. Unlike the traditional linear economy (take-make-dispose), which is based on a "take-make-waste" approach, the circular economy focuses on designing products, processes, and systems that prioritize resource efficiency, reuse, recycling, and especially regeneration in all aspects of economy and society.

In a circular economy, products are designed for durability, reparability, and recyclability. Materials are kept in use for as long as possible through strategies such as remanufacturing, refurbishing, and recycling. The circular economy also promotes the sharing economy, where products and resources are shared, leading to reduced consumption and waste generation. The circular economy contributes to sustainability by reducing the pressure on finite resources, minimizing environmental impacts, and creating economic opportunities through the development of new business models and value chains. Finally, Materials Science for Sustainability focuses on the development and application of materials and innovative smart materials that have a reduced environmental footprint and contribute to sustainable practices. It involves researching and designing materials with improved properties, durability, recyclability, and low energy consumption during production.

Materials scientists work towards developing eco-friendly materials, exploring alternatives to non-renewable resources, and improving manufacturing processes to minimize waste and emissions. This field encompasses the study of renewable materials, bio-based materials, nanomaterials, lightweight materials, sustainable manufacturing techniques and as above mentioned the design of novel smart materials. Materials Science for Sustainability plays a crucial role in various industries, including construction, energy, transportation, electronics, packaging, and consumer goods. It enables the development of sustainable and environmentally friendly products, reduces reliance on non-renewable resources, and supports the transition towards a more sustainable and regenerative future for the societies and humanity.

Interconnected these fields aim to promote sustainable practices and processes, reduce environmental footprints, and create a more resilient and equitable society. They address the challenges of resource scarcity, climate change, and waste management, seeking innovative solutions for a sustainable and prosperous future society worldwide.

This integral field encompasses research (Howarth, R. B. (1997), da Cunha Bezerra, M. C., et al. (2020), Arowoshegbe, A. O., et. al. (2016)) mainly in the following topics:

Environmental Science:

Assessing and addressing environmental impacts, conservation of natural resources, and mitigating climate change.

Renewable Energy:

Promoting and researching clean and renewable energy sources such as solar, wind, hydro, and geothermal power.

Material Science for sustainability research:

Developing and advancing materials that are more environmentally friendly, energy-efficient, and socially responsible. Including exploring alternative

materials, such as bioplastics, recycled plastics, sustainable textiles, and bio-based materials that can replace conventional, resource-intensive materials. Focusing, moreover, on Energy Efficiency, improving energy efficiency by developing materials with enhanced properties, such as high thermal insulation, lightweight construction materials, and advanced coatings for energy-saving applications. Additionally, focusing developing technologies and processes for efficient recycling and reuse of materials by designing materials that are recyclable, developing separation and sorting techniques, and creating innovative recycling methods to reduce waste and promote a circular economy. Sustainable Packaging, Life Cycle Assessment, Renewable Energy Materials, Water and Air Purification, Sustainable Construction Materials, Biomimicry and Bioinspired Materials issues are of special interest of this department.

Circular Economy:

Advancing the concept of reducing waste, recycling, and reusing materials to minimize resource consumption and waste generation.

Climate Change Mitigation and Adaptation:

Developing strategies to reduce greenhouse gas emissions and building resilience to the impacts of climate change.

Sustainable Agriculture and Food Systems:

Promoting sustainable farming practices, food security, and reducing the environmental footprint of agriculture.

Water Management:

Ensuring sustainable use and management of water resources, addressing water scarcity, and improving water quality.

Sustainable Transportation:

Encouraging the use of low-carbon and efficient transportation modes, promoting electric vehicles, and improving public transportation systems.

Corporate Sustainability:

Assisting businesses in integrating sustainable practices into their operations, supply chains, and corporate social responsibility initiatives.

Sustainable Urban Planning:

Designing cities and communities to be environmentally friendly, socially inclusive, and economically vibrant.

Social Sustainability:

Fostering social equity, inclusivity, and community engagement in sustainable initiatives.

Sustainable Waste Management:

Implementing waste reduction strategies, recycling programs, and proper disposal of hazardous materials.

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Biodiversity Conservation:

Protecting and restoring biodiversity through conservation efforts, habitat preservation, and sustainable land management.

The herein research has been organized again by adopting SCOPUS peer reviewed research database querying. The complex queries involved included the terms “Sustainability”, “Circular Economy”, and “Recycling”, “Recycling Materials” with publication year after 2015 and country of affiliation Albania. The conducted advanced search is limited only to English

language journal articles, The conducted advanced search is limited only to English language journal articles in Engineering and Material Science considering again that the research efforts with such characteristics would have the best probabilities for resulting in higher impact in the state-of-the-art research and development worldwide.

Based on such a setup the results obtained with regards to the relevant state of the art research in Albania are shown in figures 7, 8, 9 and table 3 below.

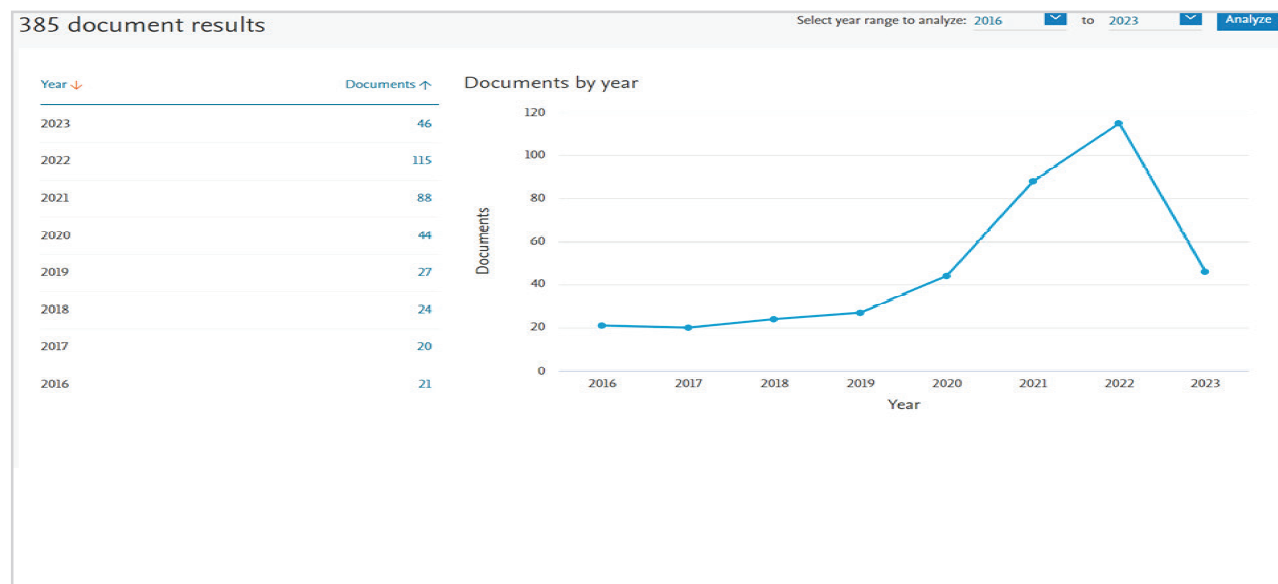


Figure 7- Subject areas in the fields of Sustainability, Circular Economy and Materials Science for Sustainability in research in Albania since 2016.

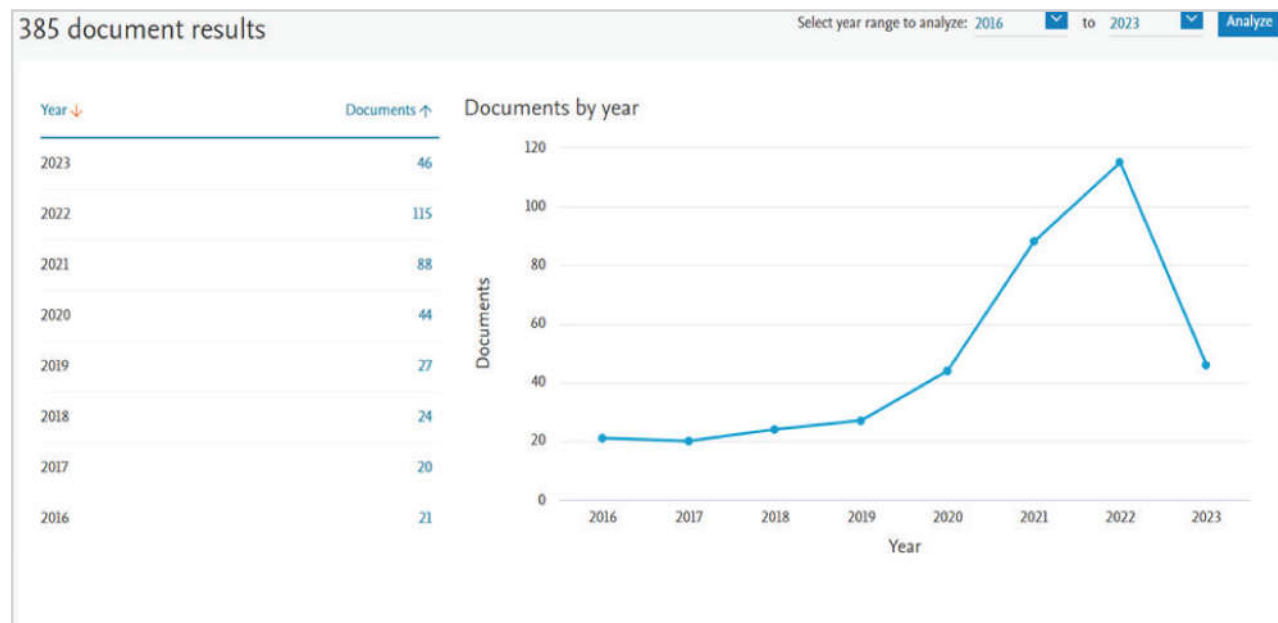


Figure 8- Evolution of research in the field of Sustainability, Circular Economy and Materials Science for Sustainability in Albania since 2016.

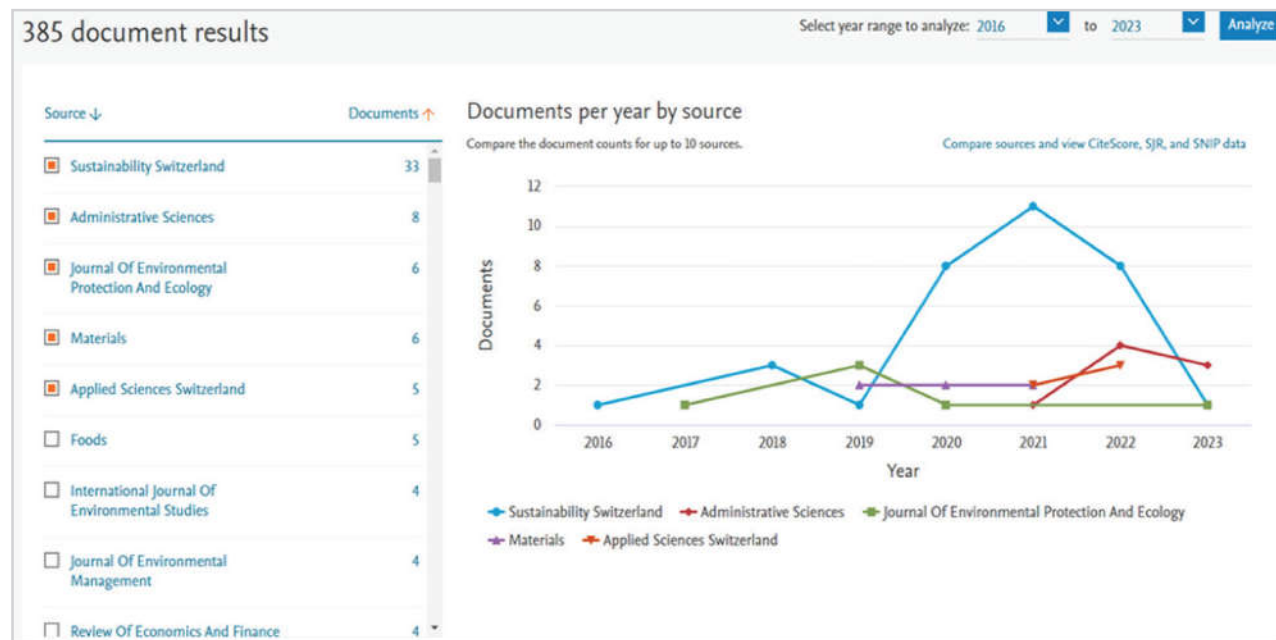


Figure 9 – Main sources (journals) in the field of Sustainability, Circular Economy and Materials Science for Sustainability where the research in Albania since 2016 has been published.

Table 3 – Research topics in the field of Sustainability, Circular Economy and Materials Science for Sustainability in Albania in the first half of 2023.

Authors	Title	Year	Source title	Affiliations
Miço H.; Cungu J.	Entrepreneurship Education, a Challenging Learning Process towards Entrepreneurial Competence in Education	2023	Administrative Sciences	Department of Law, Epoka University, Tirana, 1032, Albania; Department of Linguistics, University of Elbasan "Aleksandër Xhuvani", Elbasan, 3001, Albania
Skura E.; Koto R.; Lika E.; Shahini S.; Sallaku F.	Comparative characteristics of plant protection against copper and sulphur influence; [Порівняльна характеристика засобів захисту рослин від впливу міді та сірки]	2023	Scientific Horizons	Agricultural University of Tirana, 1025, Paisi Vodica Str., Tirana, Albania
Yunitsyna A.; Shtepani E.	Investigating the socio-spatial relations of the built environment using the Space Syntax analysis – A case study of Tirana City	2023	Cities	Epoka University, rr. Tiranë-Rinas, Km 12, Tirana, 1039, Albania; Tirana Metropolitan University, rr. Sotir Kolea, Tirana, 1000, Albania
Çipi A.; Fernandes A.C.R.D.; Ferreira F.A.F.; Ferreira N.C.M.Q.F.; Meidutė-Kavaliauskienė I.	Detecting and developing new business opportunities in society 5.0 contexts: A socio-technical approach	2023	Technology in Society	University of Vlora "Ismail Qemali", Sheshi Pavarësia, Vlorë, 9401, Albania;
Fait M.; Magni D.; Perano M.; Farina Briamonte M.; Sasso P.	Grassroot processes of knowledge sharing to build social innovation capabilities	2023	Journal of Knowledge Management	Scientific Research Center, Reald University College, Vlorë, Albania

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Kastrati Z.; Imran A.S.; Daudpota S.M.; Memon M.A.; Kastrati M.	Soaring Energy Prices: Understanding Public Engagement on Twitter Using Sentiment Analysis and Topic Modeling with Transformers	2023	IEEE Access	University of New York Tirana, Department of Computer Science, Tirana, 1001, Albania
Sinaj Z.; Ramosacaj M.; Kushta E.	Performance management assessment in agriculture organisations (using factorial parameters case of Albania); [Оцінка управління ефективністю в сільськогосподарських організаціях (з використанням факторних параметрів на прикладі Албанії)]	2023	Scientific Horizons	University "Ismail Qemali" Vlore, Kosova Str., Vlore, 9400, Albania
Shahu E.; Hoxha A.; Zhllima E.; Imami D.; Gjika I.	Factors influencing farmers' willingness to participate in Farm to School programmes – The case of Albania	2023	Studies in Agricultural Economics	Department of Mathematics and Informatics, Agricultural University of Tirana, Tirana, Albania; Department of Finance and Accounting, Agricultural University of Tirana, Tirana, Albania; Department of Economy and Rural Development Policies, Agricultural University of Tirana, Rruga Paisi Vodica 1025, Tirana, Albania;
Draçi P.; Demi A.	RESIDENTS' PERCEPTIONS OF SUSTAINABLE TOURISM GOVERNANCE AND DEVELOPMENT	2023	Corporate and Business Strategy Review	Aleksandër Moisiu University of Durrës, Durrës, Albania
Puci J.; Draci P.; Demi A.; Merja Z.	An assessment of bank profitability: Evidence from Albania	2023	International Journal of Applied Economics, Finance and Accounting	Canadian Institute of Technology, Tirana, Albania; University "Aleksandër Moisiu" Durrës, Albania
Di Renzo M.; Letizia F.; Di Martino C.; Karaulli J.; Kongoli R.; Testa B.; Avino P.; Guerriero E.; Albanese G.; Monaco M.; Iorizzo M.	Natural Fiano Wines Fermented in Stainless Steel Tanks, Oak Barrels, and Earthenware Amphora	2023	Processes	Department of Agriculture, Environmental and Food Sciences, University of Molise, Campobasso, 86100, Italy; Food and Research Center, Agricultural University of Tirana, Tirana, 1000, Albania; Agri-Food Technological Department, Agricultural University of Tirana, Tirana, 1000, Albania;
Nuez I.; Giovos I.; Tiralongo F.; Penadés-Suay J.; Cetkovic I.; Di Lorenzo M.; Kleitou P.; Bakiu R.; Bradai M.N.; Almabruk S.A.A.; Spyridopoulou R.N.A.; Sabbio A.; Gazo M.	Assessing the current status of <i>Hexanchus griseus</i> in the Mediterranean Sea using local ecological knowledge	2023	Marine Policy	Albanian Center for Environmental Protection and Sustainable Development, Tirane, Albania. Agricultural University of Tirana, Tirane, Albania;

Hysa E.; Foote R.	Improving operational - developmental connections: foregrounding an alignment - dealignment - realignment perspective	2023	International Journal of Education Economics and Development	Department of Economics, Epoka University, Albania; Caribbean College of the Bible International, Trinidad and Tobago
Kelmendi M.; Aliu M.	Research of the Ecological Status in the Waters of the River Sitnica-Kosovo	2023	International Journal of Environmental Science and Development	Faculty of Food Technology, The University "Isa Boletini" in Mitrovica, Albania
Balestra A.; Caruso R.	Vaccines between war and market	2023	International Area Studies Review	Università Cattolica del Sacro Cuore, Italy; Catholic University 'Our Lady of Good Counsel', Albania
Vallja L.; Duka S.; Shehu A.; Broli N.; Vasjari M.	CHARACTERIZATION AND DISTRIBUTION OF PHOSPHOROUS IN SEDIMENTS. CASE STUDY: KUNE VAINI LAGOON SYSTEM (LEZHA, ALBANIA)	2023	Journal of Hygienic Engineering and Design	Department of Chemistry, Faculty of Natural Sciences, University of Tirana, Boulevard Zogu 1, Tirana, 1001, Albania
Pazaj E.; Mane A.K.	Factors Affecting the Olive Production Chain in Albania	2023	WSEAS Transactions on Business and Economics	Faculty of Economy and Agribusiness, Agricultural University of Tirana, Tirana, Albania
Vis C.; Schuurmans J.; Aouizerate B.; Craggs M.A.; Batterham P.; et al.	Effectiveness of Self-guided Tailored Implementation Strategies in Integrating and Embedding Internet-Based Cognitive Behavioral Therapy in Routine Mental Health Care: Results of a Multicenter Stepped-Wedge Cluster Randomized Trial	2023	Journal of Medical Internet Research	Institute of Public Health, Tirana, Albania; Department of Public Health, Faculty of Medicine, University of Medicine, Tirana, Albania;
Prendi L.; Murrja A.	How Are the Balkan Countries Progressing Toward Green Economy?	2023	Review of Economics and Finance	Faculty of Business, "Aleksander Moisiu" University, Durres, Albania; Faculty of Economics and Agribusiness, Agricultural University of Tirana, Albania
Perano M.; Cammarano A.; Varriale V.; Del Regno C.; Michelino F.; Caputo M.	Embracing supply chain digitalization and unphysicalization to enhance supply chain performance: a conceptual framework	2023	International Journal of Physical Distribution and Logistics Management	Department of Management, Reald University College, Vlorë, Albania
Ndou V.; Hysa E.; Maruccia Y.	A Methodological Framework for Developing a Smart-Tourism Destination in the South-eastern Adriatic-Ionian Area	2023	Sustainability (Switzerland)	Department of Engineering for Innovation, University of Salento, Lecce, 73100, Italy; Department of Economics, Epoka University, Tirana, 1032, Albania
Drishti E.; Carmichael F.	Dead-end jobs or stepping-stones? Precarious work in Albania	2023	Personnel Review	Department of Business Administration, University of Shkodra "Luigj Gurakuqi", Shkoder, Albania;
Kicaj H.; Polukarov Y.; Prakhovnik N.; Polukarov O.; Kachynska N.	How war in Ukraine is affecting the climate	2023	International Journal of Environmental Studies	Department of Biology, Section of Environmental Biology, University Ismail Qemali, Vlorë, Albania;

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Hoxhaj R.; Miti F.	The impact of COVID-19 on work from home of ethnic groups in the USA: evidence from time-use data	2023	International Journal of Manpower	Department of Economics, Faculty of Economics and Business Administration, Ghent University, Ghent, Belgium; Department of Economics, University Ismail Qemali of Vlora, Vlore, Albania
Hallunovi A.	FINANCIAL RESULTS VS. IMPLEMENTATION OF ACCOUNTING PRACTICES	2023	Journal of Governance and Regulation	Finance Accounting Department, Aleksandër Moisiu University of Durrës, Durrës, Albania
Fabbrizzi E.; Giakoumi S.; De Leo F.; Tamburello L.; et al.	The challenge of setting restoration targets for macroalgal forests under climate changes	2023	Journal of Environmental Management	University of Vlora "Ismail Qemali", Sheshi Pavaresia, Vlore, Albania;
Gjika I.; Pano N.	Human resource development AS a contributor to industry 4.0 implementation IN Albania	2023	Electronic Journal of Information Systems in Developing Countries	Mediterranean University of Albania, Tirana, Albania
Ahmetaj B.; Kruja A.D.; Hysa E.	Women Entrepreneurship: Challenges and Perspectives of an Emerging Economy	2023	Administrative Sciences	Department of Business Administration, Epoka University, Tirana, 1032, Albania; Department of Economics, Epoka University, Tirana, 1032, Albania
Dorri A.; Alcani M.; Dhoska K.; Bako M.	COMPUTATIONAL SIMULATION OF HEAT TRANSFER THROUGH FINS OF DIFFERENT SHAPES IN AN AIR-COOLED INTERNAL COMBUSTION ENGINE	2023	International Journal on Technical and Physical Problems of Engineering	Department of Energy, Polytechnic University of Tirana, Tirana, Albania; Department of Production and Management, Polytechnic University of Tirana, Tirana, Albania
Ivanovic V.; Lami E.; Imami D.	Political Budget Cycles in Early Versus Regular Elections: The Case of Serbia	2023	Comparative Economic Studies	Ministry of Finance and Economy of Albania, Tirana, Albania; Faculty of Economics and Agribusiness, Agricultural University of Tirana, Tirana, Albania
Jiang X.; Akbar A.; Hysa E.; Akbar M.	Environmental protection investment and enterprise innovation: evidence from Chinese listed companies	2023	Kybernetes	Department of Economics, Epoka University, Tirana, Albania;
Shahini E.; Luhovyj S.; Kalynychenko H.; Starodubets O.; Trybrat R.	Rational use of oilseed waste to increase dairy productivity	2023	International Journal of Environmental Studies	Economic Science Department, Aleksandër Moisiu University of Durrës, Durrës, Albania;
Mazaris A.D.; Dimitriadis C.; Papazekou M.; et al.	Priorities for Mediterranean marine turtle conservation and management in the face of climate change	2023	Journal of Environmental Management	Wildlife and Health Research Center, Agricultural University of Tirana, Tirana, Albania; University of Shkodra "Luigj Gurakuqi", Shkoder, Albania;

Januzi V.; Sena L.; Bytyqi N.	DETERMINATION OF OPTIMAL CONCENTRATION OF ORGANIC SELENIUM ON EGG PRODUCTION IN LAYING HENS	2023	Journal of Hygienic Engineering and Design	Faculty of Agriculture and Environment, Agricultural University of Tirana, Kodër Kamëz, Tirana, 1029, Albania; Faculty of Agriculture and Veterinary, University of Pristina, Boulevard "Bill Clinton" nn, Pristina, Kosovo, 10000
Ismail M.M.; Mostafa N.N.; Kazia E.; Elhenawy I.	Machine learning for False Information Detection in Social Internet of Things	2023	Fusion: Practice and Applications	Faculty of Computers and Informatics, Zagazig University, Sharqiyah, Zagazig, 44519, Egypt; Department of Applied and Computer Sciences, Barleti University, Albania
Puci J.; Demi A.; Kadiu A.	IMPACT OF MACROECONOMIC VARIABLES ON THE CONSTRUCTION SECTOR	2023	Corporate and Business Strategy Review	Canadian Institute of Technology, Kompleksi Xhura, Tirana, Albania; University "Aleksandër Moisiu", Spitalë, Durrës, Albania
Rexhaj F.; Vilks A.; Sirenko N.; Dubinina M.; Melnyk O.; Bodnar O.	Participation of international organisations in solving the problems of the agricultural sector of Ukraine	2023	International Journal of Environmental Studies	Department of Plant Protection, Agricultural University in Tirana, Tirana, Albania;
Angjeli G.; Pano N.; Malollari I.	ROLE OF CAPACITY BUILDING FOR THE SUSTAINABILITY OF THE NEW ENVIRONMENTAL TRENDS WITHIN THE ALBANIAN HIGHER EDUCATION INSTITUTIONS	2023	Journal of Environmental Protection and Ecology	Mediterranean University of Albania, Tirana, Albania; University of Tirana, Tirana, Albania
Lahi B.; Nurja I.	Economic and Psychological Well-being in Pandemic Times	2023	WSEAS Transactions on Business and Economics	Department of Psychology, University of New York Tirana, Albania; Department of Economic and Finance, University of New York Tirana, Albania
Bexholli A.; Potryvaieva N.; Dovgal O.; Kuzoma V.; Pavliuk S.	Innovation in Ukrainian agriculture to mitigate the impact of invasion	2023	International Journal of Environmental Studies	Department of Plant Protection, Agricultural University in Tirana, Tirana, Albania
Kalaja R.; Kurti S.; Myshketa R.	Service quality and patient satisfaction with private health care services in Albania	2023	International Journal of Public Health Science	Department of Medical Technical Sciences, Faculty of Professional Studies, University "Aleksandër Moisiu", Durrës, Albania; Department of management, Faculty of Economy, University of Tirana, Tirana, Albania; Department of Management, University "Aleksandër Moisiu", Durrës, Albania
Ramallari A.; Velaj E.	The Impact of Education in Economy. The Case of Albania	2023	Review of Economics and Finance	Economics Department, Business Faculty, University Aleksandër Moisiu, Durrës, Albania
Ramallari A.; Merko F.	THE RELATIONSHIP BETWEEN INFLATION AND GROSS DOMESTIC PRODUCT: ALBANIA CASE	2023	Corporate Law and Governance Review	Faculty of Business, Department of Economic Sciences, University Aleksandër Moisiu, Durrës, Albania

Marko O.; Gjipalaj J.; Profka D.; Shkodrani N.	Soil erosion estimation using Erosion Potential Method in the Vjosa River Basin, Albania	2023	AIMS Environmental Science	Department of Environmental Engineering, Faculty of Civil Engineering, Polytechnic University of Tirana, Rruga Muhamet Gjollështa Nr. 54, Tirana, 1023, Albania; Department of Civil Engineering, Faculty of Civil Engineering, Polytechnic University of Tirana, Rruga Muhamet Gjollështa Nr. 54, Tirana, 1023, Albania
Malka L.; Bidaj F.; Kuriqi A.; Jaku A.; Roçi R.; Gebremedhin A.	Energy system analysis with a focus on future energy demand projections: The case of Norway	2023	Energy	Department of Energy Polytechnic University of Tirana, Sheshi "Nene Tereza," nr. 4, Tirane, Albania;
Lulaj E.; Dragusha B.; Hysa E.	Investigating Accounting Factors through Audited Financial Statements in Businesses toward a Circular Economy: Why a Sustainable Profit through Qualified Staff and Investment in Technology?	2023	Administrative Sciences	Faculty of Economy, University of Shkodra, Jeronim De Rada, Sheshi "Dugajt e Reja", Shkoder, 4001, Albania; Department of Economics, Epoka University, Tirana, 1032, Albania
Ziarno M.; Zarëba D.; Dryzek W.; Hassaliu R.; Florowski T.	Effect of the Addition of Soy Beverage and Propionic Bacteria on Selected Quality Characteristics of Cow's Milk Yoghurt Products	2022	Applied Sciences (Switzerland)	; Faculty of Biotechnology and Food, Agricultural University of Tirana, Tirana, 1029, Albania;

SUSTAINABLE DEVELOPMENT AND ECONOMIC GROWTH

Sustainable development and economic growth are two intertwined concepts that aim to promote a prosperous and equitable future while preserving the environment and natural resources for future generations. While economic growth refers to an increase in the production and consumption of goods and services within an economy, sustainable development emphasizes a holistic approach that integrates economic, social, governmental and environmental considerations.

This field encompasses research (Alvino, F., et.al. (2021), Dos Santos, P. H., et.al.. (2019), Halkos, G., et al.) mainly in the following topics:

Sustainable Business Development and Economic Growth:

All aspects of business modelling, planning and development as well as all aspects of Economics (Macro and Micro), Finance and Economic Growth incorporating all traditional and modern financing tools too.

Sustainable Development:

Planning and implementing strategies for economic growth that considers social, environmental, and economic factors, while ensuring long-term sustainability.

Sustainable Finance and Investment:

Promoting mainly ESG Integration. This involves incorporating ESG criteria into investment analysis and decision-making processes. It includes assessing companies' ESG performance, analyzing risks and opportunities associated with sustainability factors, and integrating this information into investment strategies. Moreover, promoting Impact Investing, focusing on generating measurable social and environmental benefits alongside financial returns. It involves directing investments towards projects, companies, or funds that aim to address specific sustainability challenges, such as clean energy, affordable housing, or access to healthcare. Additionally, will promote research on Green Finance, referring to financial products and services that specifically support environmentally friendly projects and initiatives. This field includes green bonds, green loans, and green investment funds, which direct capital towards activities with positive environmental impacts, such as renewable energy, energy efficiency, and sustainable infrastructure. These fields are interconnected and evolving as sustainability becomes increasingly integrated into the financial sector. Organizations and professionals in sustainable finance and investment work towards aligning financial decisions with sustainability goals, contributing to a more sustainable and resilient global economy. These are major aspects that will be considered in the research efforts of the proposed department.

Green Economy:

Promoting economic growth while minimizing environmental impacts, focusing on sectors such as renewable energy, energy efficiency, sustainable agriculture, waste management, and clean technologies to foster sustainable economic development.

Responsible Business Practices:

Promoting responsible business practices, that entails encouraging corporate social responsibility (CSR), ethical supply chains, fair labor practices, and sustainable business models. CSR reporting, stakeholder engagement, human rights, and social impact assessments are included in the interests of the department.

Sustainable Tourism:

Focusing on promoting tourism that minimizes negative environmental and socio-cultural impacts while maximizing economic benefits for local communities. Ecotourism, community-based tourism, sustainable destination management, and responsible tourism practices are included in the interests of the department.

Social Entrepreneurship:

Focusing on addressing social and environmental challenges. Social enterprise development, impact investing, and business models that integrate social and environmental considerations into economic activities are included in the interests of the department.

Financial Inclusion:

Focusing on ensuring access to affordable financial

services for all individuals, including marginalized and underserved populations. Microfinance, inclusive banking, digital financial services, and financial literacy programs are included in the interests of the department.

Green Jobs and Skills Development:

Focusing on developing skills and training programs to support the transition to a green economy, such as renewable energy technicians, sustainable agriculture experts, and environmental consultants.

Sustainable Development Policy and Planning:

Focusing on designing and implementing policies and plans that integrate sustainable development principles into national and local decision-making processes. Sustainable development goal (SDG) planning, sustainable development indicators, and policy frameworks for sustainable economic growth are included in the interests of the department.

The herein research has been organized again by adopting SCOPUS peer reviewed research database querying. The complex queries involved included the terms “ Sustainable Development”, “ Economic Growth”, and “ Sustainable Growth “ with publication year after 2015 and country of affiliation Albania. The conducted advanced search is limited only to English language journal articles considering again that the research efforts with such characteristics would have the best probabilities for resulting in higher impact in the state-of-the-art research and development worldwide.

Based on such a setup the results obtained with regards to the relevant state of the art research in Albania are shown in figures 10, 11, 12 and table 4 below.

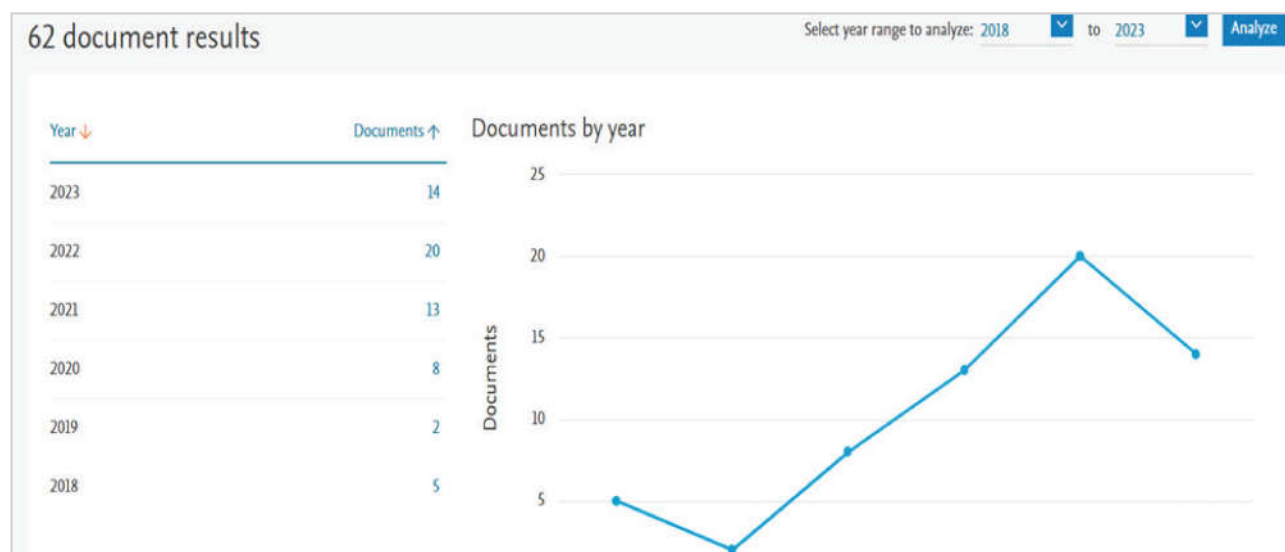


Figure 10- Subject areas in the fields of Sustainable Development and Economic Growth in research in Albania since 2016

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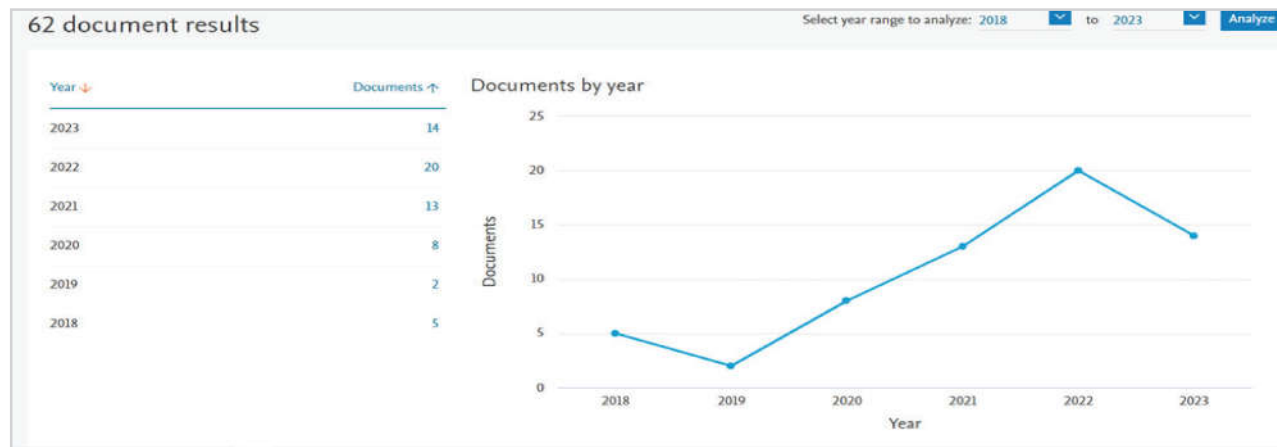


Figure 11- Evolution of research in the field of Sustainable Development and Economic Growth in Albania since 2016

Figure 12- Main sources (journals) in the field of Sustainable Development and Economic Growth where the research in Albania since 2016 has been published.

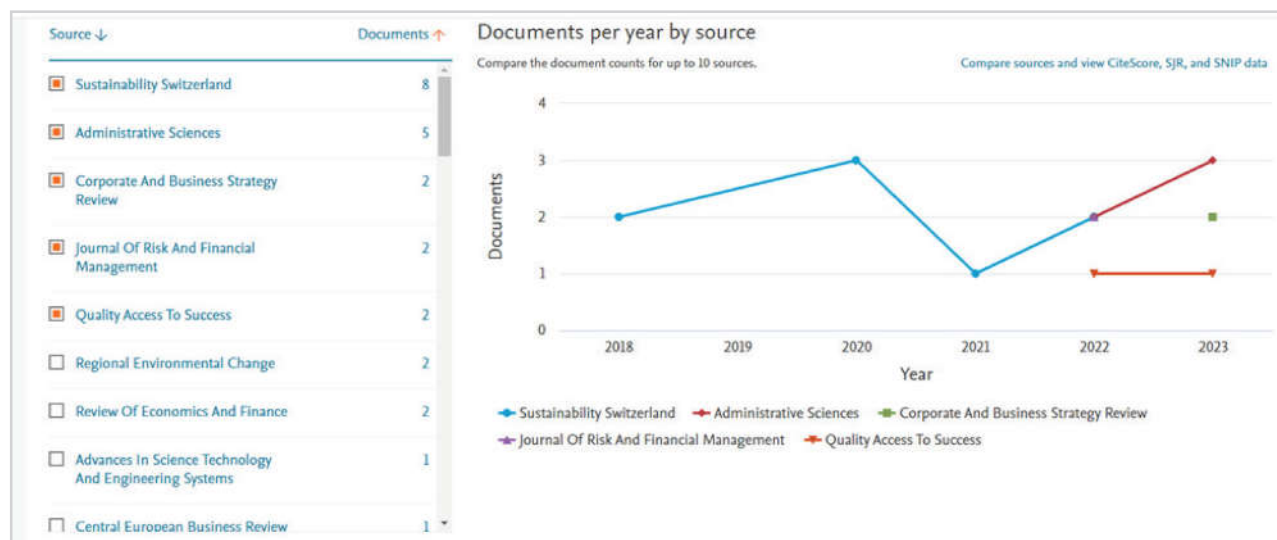


Table 4 – Research topics in the field of Sustainable Development and Economic Growth in Albania in the first half of 2023.

Authors	Title	Year	Source title	Affiliations
Xhindi N., Xhindi T.	The Policy of Urbanization Growth and Its Effects in the Albanian Economy in 1984–2020 [Polityka wzrostu urbanizacji i jej skutki w gospodarce Albanii w latach 1984–2020]	2023	Studia Iuridica Lublinensia	Mediterranean University of Albania, Albania; European University of Tirana, Albania
Taysum A., Hysa F.	Typology of Epistemologies for Democratizing Knowledge and Policy Benefits for All Mainstreamed by Doctoral-Study	2023	European Journal of Educational Research	European Commission Expert, United Kingdom; University College Dardania Prishtina, KOSOVA, University of Elbasan "Aleksander Xhuvani", Albania

Shahini E., Luhovyi S., Kalynychenko H., Starodubets O., Trybrat R.	Rational use of oilseed waste to increase dairy productivity	2023	International Journal of Environmental Studies	Economic Science Department, Aleksandër Moisiu University of Durrës, Durres, Albania;
Ramallari A., Merko F.	THE RELATIONSHIP BETWEEN INFLATION AND GROSS DOMESTIC PRODUCT: ALBANIA CASE	2023	Corporate Law and Governance Review	Faculty of Business, Department of Economic Sciences, University Aleksandër Moisiu, Durrës, Albania
Puci J., Demi A., Kadiu A.	IMPACT OF MACROECONOMIC VARIABLES ON THE CONSTRUCTION SECTOR	2023	Corporate and Business Strategy Review	Canadian Institute of Technology, Kompleksi Xhura, Tirana, Albania; University "Aleksandër Moisiu", Spitalë, Durrës, Albania
Prendi L., Murrja A.	How Are the Balkan Countries Progressing Toward Green Economy?	2023	Review of Economics and Finance	Faculty of Business, "Aleksandër Moisiu" University, Durres, Albania; Faculty of Economics and Agribusiness, Agricultural University of Tirana, Albania
Miço H., Cungu J.	Entrepreneurship Education, a Challenging Learning Process towards Entrepreneurial Competence in Education	2023	Administrative Sciences	Department of Law, Epoka University, Tirana, 1032, Albania; Department of Linguistics, University of Elbasan "Aleksandër Xhuvani", Elbasan, 3001, Albania
Merko F., Habili M.	IMPACT OF INTEREST RATE, EXCHANGE RATE, AND INFLATION ON COMMERCIAL BANKS' PERFORMANCE	2023	Corporate and Business Strategy Review	Economics Department, Business Faculty, University "Aleksandër Moisiu", Durres, Albania; Department of Marketing Management, Tirana Business University College, Tirana, Albania
Lulaj E., Dragusha B., Hysa E.	Investigating Accounting Factors through Audited Financial Statements in Businesses toward a Circular Economy: Why a Sustainable Profit through Qualified Staff and Investment in Technology?	2023	Administrative Sciences	Faculty of Management in Tourism, Hospitality and Environment, "Haxhi Zeka" University, Eliot Engel, Peja, Kosovo, Faculty of Economy, University of Shkodra, Jeronim De Rada, Sheshi "Dugajt e Reja", Shkoder, 4001, Albania; Department of Economics, Epoka University, Tirana, Albania
Lubonja O., Hakrama K.	The Connection Between Urbanization, Energy Consumption, Foreign Direct Investments and Their Impact on The Environmental in Albania	2023	Quality - Access to Success	European University of Tirana, Department of Engineering and Architecture, "Xhanfize Keko", Nd 56, Tirana, Albania
Jiang X., Akbar A., Hysa E., Akbar M.	Environmental protection investment and enterprise innovation: evidence from Chinese listed companies	2023	Kybernetes	Department of Economics, Epoka University, Tirana, Albania;

Hoxha V., Hasani I.	Decision-making biases in property investments in Prishtina, Kosovo	2023	Journal of Property Investment and Finance	Department of Real Estate, College ESLG, University for Business and Technology, Prishtina, Albania; College ESLG, Prishtina, Albania
Ahmetaj B., Kruja A.D., Hysa E.	Women Entrepreneurship: Challenges and Perspectives of an Emerging Economy	2023	Administrative Sciences	Department of Business Administration, Epoka University, Tirana, Albania; Department of Economics, Epoka University, Tirana, Albania

DISCUSSION AND CONCLUSIONS

The herein research study deals with the state of the art current research in Albania, regarding the subjects of digitalization, automation and sustainable development and all associated key issues. Based on SCOPUS peer review research database we have conducted the proposed research for the last 8 years, namely, the years 2016-first half 2023. It is clearly outlined from the data that there is significant increase of interest in this field. However, only few universities are involved in such research despite the large of universities and higher education institutions in Albania. Moreover, despite the fact of the existence of more than 10 established research institutions in Albania, only around 20% out of them is involved in such a research and non systematically at all. The need for a dedicated research institution in the aforementioned fields would be of great significance for the country.

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